
PART I - ADMINISTRATIVE

Section 1. General administrative information

Title of project

Evaluate Bull Trout Population Status/N.F. Clearwater R - Idfg

BPA project number: 20148

Contract renewal date (mm/yyyy): ☐ **Multiple actions?**

Business name of agency, institution or organization requesting funding

Idaho Department of Fish and Game and Nez Perce Tribe--Subproposal

Business acronym (if appropriate) IDFG-NPT

Proposal contact person or principal investigator:

Name Tim Cochnauer

Mailing Address 1540 Warner

City, ST Zip Lewiston, ID 83501

Phone 208-799-5010

Fax 208-799-5012

Email address tcochnau@idfg.state.id.us

NPPC Program Measure Number(s) which this project addresses

10.1c.3, 10.3c.6, 10.1c.1

FWS/NMFS Biological Opinion Number(s) which this project addresses

None

Other planning document references

State of Idaho Bull Trout Conservation Plan, Idaho Department of Fish and Game Management Plan, 1996-2000, Columbia Basin Authority Draft Multi-year Implementation Plan, Evaluation of Current Environmental Conditions and Operations of Dworshak Reservoir, Clearwater River, Idaho, and an Analysis of Fisheries Management Alternatives

Short description

Evaluate distribution, habitat use, and movement patterns of bull trout (*Salvelinus confluentus*) in the N.F. Clearwater River drainage, including Dworshak Reservoir.

Target species

Bull trout (*Salvelinus confluentus*)

Section 2. Sorting and evaluation

Subbasin

Clearwater River

Evaluation Process Sort

CBFWA caucus	Special evaluation process	ISRP project type
Mark one or more caucus	If your project fits either of these processes, mark one or both	Mark one or more categories
<input type="checkbox"/> Anadromous fish <input checked="" type="checkbox"/> Resident fish <input type="checkbox"/> Wildlife	<input checked="" type="checkbox"/> Multi-year (milestone-based evaluation) <input type="checkbox"/> Watershed project evaluation	<input type="checkbox"/> Watershed councils/model watersheds <input type="checkbox"/> Information dissemination <input type="checkbox"/> Operation & maintenance <input type="checkbox"/> New construction <input checked="" type="checkbox"/> Research & monitoring <input type="checkbox"/> Implementation & management <input type="checkbox"/> Wildlife habitat acquisitions

Section 3. Relationships to other Bonneville projects

Umbrella / sub-proposal relationships. List umbrella project first.

Project #	Project title/description
20557	Evaluate Bull Trout Population Status / N.F. Clearwater River - NPT & IDFG
20147	Evaluate Bull Trout Population Status / N.F Clearwater River - NPT
20148	Evaluate Bull Trout Population Status / N.F. Clearwater River - IDFG

Other dependent or critically-related projects

Project #	Project title/description	Nature of relationship
8709900	Dworshak Dam Impacts Assessment and Fisheries Investigation	Assessing entrainment of fish through Dworshak Dam and testing alternatives to reduce loss
8740700	Dworshak Impacts/M&E Biological-Integrated Rule Curves	Assessing impact of present rule curves and their impacts on the biological communities in Dworshak Reservoir
9501600	Genetic Inventory of Westslope Cutthroat Trout in the N.F. Clearwater Basin	Sampling procedures for cutthroat trout provides information on distribution of bull trout in drainage.
9405400	Bull Trout Studies in Central and N.E. Oregon	Study methods and protocols between studies are similar, and thus comparison between basins may lead

		to identification of regional patterns.
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Section 4. Objectives, tasks and schedules

Past accomplishments

Year	Accomplishment	Met biological objectives?

Objectives and tasks

Obj 1,2,3	Objective	Task a,b,c	Task
1	Identify bull trout subpopulations and determine the status of the bull trout subpopulations in North Fork Clearwater River drainage.	a	Tag juvenile and adult bull trout in the reservoir and throughout the N.F. Clearwater River basin and observe movements and spawning behaviors
		b	Observe temporal habitat use (i.e., spawning, early rearing, wintering) and critical migratory corridors. Define spawning, early rearing, and winter habitat characteristics. Define critical migratory corridors.
		c	Determine distribution of bull trout. Estimate population structure . Conduct redd counts and identify breeding individuals. Assess condition and growth
2	Identify how bull trout use and are affected by Dworshak Reservoir and operations	a	Monitor radio/sonic-tagged bull trout in reservoir and drainage by watercraft, aircraft and/or road vehicle.
		b	Monitor seasonal use of reservoir in relation to dam operation with emphasis on migratory corridors into and out of the reservoir.
3	Develop and implement strategies to protect and perpetuate bull trout populations in the North Fork Clearwater River drainage	a	Coordinate with other sponsored projects in the North Fork Clearwater River drainage to determine risks to bull trout populations.

		b	Implement strategies developed in Task 3a.
		c	Monitor and evaluate strategies implemented in Task 3b.

Objective schedules and costs

Obj #	Start date mm/yyyy	End date mm/yyyy	Measureable biological objective(s)	Milestone	FY2000 Cost %
1	1/2000	12/2005	Identification of populations and population viability	Completion of data collection phase	50.00%
2	1/2000	12/2005	Identification of reservoir use and effects on population viability	Completion of data collection phase	50.00%
3	6/2005	12/2005	Development of strategies to protect and perpetuate bull trout	Assessment of risks to population	0
4	1/2006	12/2006	Implementation, evaluation and monitoring	Viable bull trout population	
				Total	100.00%

Schedule constraints

ESA permitting

Completion date

2005 for data collection phase of proposed project

Section 5. Budget

FY99 project budget (BPA obligated): \$0

FY2000 budget by line item

Item	Note	% of total	FY2000
Personnel	Fishery biologist & technician	% 31	47,529
Fringe benefits	@36.5%	% 11	17,348
Supplies, materials, non-expendable property	Boat fuel, nets, marking supplies, waders, radio tags	% 12	18,300
Operations & maintenance	Travel, vehicle rental, flights, per diem	% 14	21,700
Capital acquisitions or improvements (e.g. land,	Fixed and portable radio tag receiver, PIT scanner, outboard	% 15	23,500

buildings, major equip.)	motor		
NEPA costs		%0	
Construction-related support		%0	
PIT tags	# of tags: 200	%0	580
Travel	Meetings	%1	2,000
Indirect costs	Administrative @22.5%	%15	23,963
Subcontractor		%0	
Other		%0	
TOTAL BPA FY2000 BUDGET REQUEST			\$154,920

Cost sharing

Organization	Item or service provided	% total project cost (incl. BPA)	Amount (\$)
IDFG	Supervision, field assistance, monitoring below dam by electroshocking	%14	26,920
USFS	Assistance in stream collections	%6	12,000
		%0	
		%0	
Total project cost (including BPA portion)			\$193,840

Outyear costs

	FY2001	FY02	FY03	FY04
Total budget	\$174,600	\$182,000	\$191,400	\$130,000

Section 6. References

Watershed?	Reference
<input type="checkbox"/>	Bisson, P.A. and others. 1998. Report of the Independent Scientific Review Panel. ISRP 98-1. Report to Northwest Power Planning Council. Portland, OR
<input type="checkbox"/>	Bjornn, T.C., and J. Mallet. 1964. Movement of planted and wild trout in an Idaho river system. Transactions of the American Fisheries Society 93:70-76.
<input type="checkbox"/>	Carl, L. 1985. Management plan for bull trout in Alberta. In: MacDonald, D.D., ed. Proceedings of the Flathead River basin bull trout biology and population dynamics modeling information exchange. Cranbrook, BC: British Columbia Ministry of Environment.
<input type="checkbox"/>	Cannon, W. 1970. Dworshak Fisheries Study. Idaho Department of Fish and

	Game. Annual Report DSS 29. Lewiston, ID
<input type="checkbox"/>	Columbia River Basin Fish and Wildlife Authority. 1997. Draft multi-year implementation plan for resident fish protection, enhancement, and mitigation in the Columbia River Basin. CBFWA Tech. Planning Document. Portland, OR
<input type="checkbox"/>	Cramer, S.P., C.W. Huntington, and C.R. Steward. 1993. Harvest of Anadromous Fisheries Lost by the Nez Perce Indian Tribe as a Result of the Lewiston and Harpster Dams in the Clearwater Basin. S.P. Cramer and Associates. Gresham, OR.
<input type="checkbox"/>	Lindland, R.L. 1987. Idaho Department of Fish and Game Regional Fish Management Investigations. F-71-11. Lewiston, ID.
<input type="checkbox"/>	Pratt, K.L. 1992. A review of bull trout life history. In: Howell, P.J. and D.V. Buchanan eds. Proceedings of the Gearhart Mountain bull trout workshop. (August) Oregon Chapter, American Fisheries Society, Corvallis, OR
<input type="checkbox"/>	Ratliff, D.E., and Howell, P.J. 1992. The status of bull trout populations in Oregon. In: Howell, P.J.; Buchanan, D.V., eds. Proceedings of the Gearhart Mountain bull trout workshops; 1992 August; Gearhart Mountain, OR. Corvallis, OR.
<input type="checkbox"/>	Schriever, E. and T. Cochnauer. 1996. Idaho Department of Fish and Game Regional Fish Management Investigations. F-71-R-17. Lewiston, ID
<input type="checkbox"/>	Shepard, B.; Pratt, K.; Graham, P. 1984b. Life histories of westslope cutthroat and bull trout in the upper Flathead River basin, Montana. Kalispell, MT: Montana Department of Fish and Wildlife, and Parks. 85 p.
<input type="checkbox"/>	Statler, D.P. 1988. Dworshak Reservoir investigations – Trout, bass and forage species. Annual Report to BPA, Contract No. De-A179-87B35165. Nez Perce Department of Fisheries Resource Management. Orofino, ID
<input type="checkbox"/>	Rieman, B.E.; McIntyre, J.D. 1993. Demographic and habitat requirements for conservation of bull trout. Gen. Tech. Rep. IN-302. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 38 p.

PART II - NARRATIVE

Section 7. Abstract

Little information is known about bull trout *Salvelinus confluentus* in the North Fork Clearwater River drainage. Surveys conducted by the Idaho Department of Fish and Game, Nez Perce Tribe and other agencies have documented these fish in several streams and in Dworshak Reservoir. Historically, prior to the construction of Dworshak Dam, bull trout interfaced with bull trout from other streams with the Clearwater River system, perpetuating genetic interchange throughout the drainage. The role Dworshak Dam and reservoir play in the life history of bull trout in the North Fork is unknown. This study is designed to address life history in the North Fork Clearwater River and how, when and where bull trout use Dworshak Reservoir. Entrainment of bull trout through Dworshak Dam will be assessed by monitoring radio-tagged fish and other physical marks. Recent studies in southern Idaho reservoirs have documented movement of bull trout

downstream past dams. The significance of these losses is unknown, but could be important to viability of the population. Radio tags will be inserted in bull trout captured both in the reservoir and selected streams upstream of the reservoir. The movement of these fish will be monitored throughout the life of the tags to determine distribution in drainage. The study will be conducted over a four year period of time in concert with the Nez Perce Tribe (see umbrella/companion project)

Section 8. Project description

a. Technical and/or scientific background

In 1971 the construction of Dworshak Dam was completed near the mouth of the North Fork Clearwater River. The 218 m high dam inundates >100 km of riverine habitat on the mainstem of the North Fork Clearwater River and its tributaries. With no passage for fish migration the impacts to anadromous fish have been significant. It is estimated that approximately 33 percent of the spring Chinook *Oncorhynchus tshawytscha* and steelhead trout *Oncorhynchus mykiss* and 20 percent of the fall Chinook production in the Clearwater Basin have been lost as a direct result of the construction and operation of Dworshak Dam (Cramer, Huntington, and Steward 1993). Impacts on other native species in the basin are not as clear.

It is assumed that the construction of Dworshak Dam has significantly reduced the distribution, abundance, and population viability of native fish populations in Dworshak Reservoir and its upstream tributaries (CBFWA 1997). Information that is needed to assess this assumption however does not exist.

Historically bull trout *Salvelinus confluentus* have been observed throughout the North Fork Clearwater River basin. Bull trout were found throughout the basin prior to construction of Dworshak Dam (Cannon 1970). Bull trout are still found in many of the streams documented in the earlier studies and in Dworshak Reservoir (Lindland 1987, Statler 1989, Schriever and Cochnauer 1996, Weigel *unpublished data*). Predicting changes in the bull trout population(s) in the basin is difficult because of the lack of pre- and post-dam data, or comparable control bull trout population(s) in basins without dam and reservoir influences, on bull trout abundances and distributions. As a result, it we feel direct assessment of loss is not feasible. But, assessment of the viability of current populations remaining in the basin, and determining whether their viability and movements of trout are affected by current or potential operations of Dworshak Dam and associated reservoir will help provide the information needed to assess the need for and determine strategies to protect and perpetuate bull trout population(s) in the North Fork Clearwater basin. A minimum viable population size has been defined as one which maintains adaptability and genetic diversity, and maximizes probability of survival, with a minimum breeding population of 150-300 individuals and >95 percent probability of persistence for ≥ 5 generations (CBFWA 1997).

Although bull trout have been observed and collected throughout the basin, little information is available on their life history or distribution. More importantly, other than documenting presence or absence, no information is available regarding the role Dworshak Reservoir plays in the life history and distribution of bull trout in the drainage. Bull trout exhibit a number of life history forms (i.e., resident, fluvial and adfluvial). All life history forms can coexist within a basin. Resident bull trout spend their entire life

cycle within a single headwater tributary stream and, relative to fluvial and adfluvial forms, are small in size. Fluvial and adfluvial bull trout move extensive distances, sometimes exceeding 200 miles (Bjornn and Mallet 1964). Juvenile adfluvial fish spend one to three years in the tributaries before moving to lakes where they reside for one to three years before they return to natal streams to spawn (Pratt 1992). Fluvial forms are similar to adfluvial fish, but grow and mature in large streams and rivers. Both adfluvial and fluvial forms can attain lengths up to 700 mm (Shepard *et al.* 1984). We hypothesize that fluvial populations in the basin may either use the large mainstem river or reservoir and that populations closer to the reservoir may be more affected by the alteration of the riverine habitat than populations farther away. If viability of the population(s) is associated with reservoir use and operations the effects of Dworshak Dam on populations in the basin may differ.

Seasonal thermal and chemical barriers in the upper reaches of the reservoir, which may disrupt migration of bull trout to the upper basin have been identified (Stalter unpublished data). In August of 1994 and 1998 when pool levels were dropped to a low, water column temperature and dissolved oxygen levels reached lethal levels for bull trout in the upper portions of the reservoir. The impacts on migration and viability of bull trout populations were not assessed, but we hypothesize that if these barriers develop and block the spawning migration impacts to population viability could be significant.

Prior to construction of Dworshak Dam, bull trout had the opportunity to interchange with other bull trout populations in the Clearwater River drainage. Rieman and McIntyre (1993) indicate that characteristics of bull trout populations are consistent with the metapopulation concept that purports the need to protect genetic variation available for adaptation to change. The maintenance of adequate migratory corridors throughout the Clearwater River drainage may be an important feature to ensure the genetic interchange suggested. With construction of Dworshak Dam near the mouth of the North Fork Clearwater River, movement of bull trout is limited to downstream passage only as there is no avenue by which bull trout can move upstream past Dworshak Dam. Similarly, bull trout that move downstream of the dam can no longer return to the North Fork Clearwater River. Again, Rieman and McIntyre suggest that isolated populations face serious risk of extinction, even with no further loss of habitat.

Ratliff and Howell (1992) found that where bull trout evolved with large populations of juvenile salmon, the fish declined when salmon declined. Bull trout in rivers may parallel the distribution of potential prey (Carl 1985; Shepard and others 1984b). Because Dworshak Dam effectively blocks the migration of anadromous fish into the North Fork Clearwater River drainage, the abundance of potential prey (juvenile salmon and steelhead) has been diminished. Bull trout in the drainage may seek alternate prey in Dworshak Reservoir as kokanee salmon populations have prospered in the reservoir.

Bull trout inhabiting the reservoir are at risk of moving through the reservoir and out of the North Fork Clearwater River drainage past Dworshak Dam. Idaho Department of Fish and Game studies in the Boise River system have found bull trout captured and tagged in reservoirs have moved past dams (Flatter 1998). Similar movements of bull trout may be occurring in the North Fork Clearwater River system.

The impact of severing the migratory corridor up the North Fork Clearwater River could be critical in sustaining bull trout upstream of Dworshak Dam. Bull trout populations are prone to habitat disruption and fragmentation (Rieman and McIntyre 1993). Without more information the disruption of this migratory corridor can only be viewed as a threat to the persistence of the North Fork Clearwater River bull trout population.

By 1) determining movement patterns and how bull trout use the reservoir, mainstem North Fork, and tributaries and 2) assessing bull trout population(s) status, and how current Dworshak Dam and Reservoir operations influence movements and population(s) viability, we feel we will be able to develop and implement strategies to protect and perpetuate bull trout populations in the North Fork Clearwater River drainage.

b. Rationale and significance to Regional Programs

The Northwest Power Council Fish and Wildlife Program acknowledges the impacts of hydropower development on anadromous and native fish populations in the Columbia River Basin (NPPC 1995). The Council's program identifies the needed to: 1) protect, mitigate and enhance resident fish populations to the extent they were or are affected by construction and operation of dams, and 2) protect, mitigate and enhance resident fish in hydropower system storage projects to the fullest extent practicable from negative impacts associated with water releases. A priority of the Council's program is to rebuild to sustainable levels weak, but recoverable, native populations injured by the hydropower system, when such populations are identified by the resident fish managers.

The resident fish managers have specifically identified the need to assess the impacts of the construction and operation of Dworshak Dam on native species (e.g., bull trout, cutthroat trout) in the Lower Snake Subregion (CBFWA 1997). Section 6.6.5.3 of the Resident Fish Multi-Year implementation Plan identifies the need to: 1) maintain and restore bull trout and cutthroat population productivity reduced by the development and operation of Dworshak Dam to healthy levels, and 2) ensure that native populations are above minimum viable population sizes which maintain adaptability and genetic diversity, and maximum probability of survival (CBFWA 1997).

The Council and the resident fish managers have included specific measures and strategies in their programs to maintain, protect and restore resident fish populations impacted by hydropower. Section 10.1C of the Councils Fish and Wildlife Program (NPPC 1995) empowers fisheries managers to complete assessments of resident fish losses and gains related to the construction of each hydropower facility throughout the Columbia River Basin. And, to fund the completion of these resident fish assessments and identify the need for mitigation actions with prompt action forestalling Endangered Species Act listing for several species including bull trout and westslope cutthroat (NPPC 1995).

For native fish species (bull trout and cutthroat trout) in Dworshak and the associated upstream North Fork Clearwater River watershed, the resident fish managers

program identifies the need to: 1) identify and estimate the status of populations and groups of populations 2) identify factors limiting each population, critical habitat or conditions which limit life stages, and population sizes, and 3) select and implement measures based on distribution, status, and limiting factor assessments to improve habitat conditions, restore genetic integrity and connectivity between isolated subpopulation.

Although the Council and the resident fish managers agree that basinwide reviews of resident fish populations are needed these reviews have not yet been initiated in most basins. Baseline inventory information on native fish stocks in the Columbia Basin is lacking in most basins. Basinwide inventories of remaining native fish populations and their status are needed to identify opportunities to restore and rebuild native resident fish populations and to set priorities (Bisson 1998).

In 1998, bull trout was listed as endangered. As co-managers, the Nez Perce Tribe and Idaho Department of Fish and Game have identified the need to assess the losses and/or gains of bulltrout in the North Fork Clearwater River related to the construction of Dworshak Dam. The baseline information on bull trout populations in the North Fork Clearwater River that is needed to assess the effects of the construction and operation of Dworshak Dam and Reservoir and develop strategies to protect and perpetuate the population does not exist. General information describing the movement of bull trout in the North Fork Clearwater River drainage, and their life history relationship to Dworshak Reservoir is critical in assessing the need to: 1) maintain and/or restore complex interacting groups of bull trout populations throughout the drainage, 2) maintain the conditions of those areas presently supporting critical bull trout habitat, and 3) institute recovery strategies that produce measurable improvement in the status, abundance, and habitats of bull trout that have been adversely affected by the construction and operation of Dworshak Dam.

c. Relationships to other projects

In the North Fork Clearwater River little work has been done to quantify the impacts of the construction and operations of Dworshak Dam on resident fish. While BPA is funding projects on Dworshak Reservoir addressing the impacts to resident fish species, no work has been directed to bull trout.

In 1995, the Nez Perce Tribe began documenting the extent of hybridization between native westslope cutthroat trout and hatchery rainbow trout stocked in Dworshak Reservoir (9501600). Hybridization with exotic trout is considered the greatest threat to the conservation of the native westslope cutthroat trout in northern Idaho (Allendorf and Leary 1988). Distributions of pure and hybridized westslope cutthroat trout have been identified using nuclear DNA analysis in the North Fork Clearwater basin. Information on habitat use and spawning locations of westslope cutthroat has also been recorded. Incidental observation of habitat use and spawning locations, along with genetic samples have also been recorded and collected for bull trout during this study. This information will be used to identify study populations of bull trout and critical habitat areas. This

project will also complement two other ongoing projects, Dworshak Dam Impacts Assessment and Fisheries Investigation (8709900) and Dworshak Impacts/M&E Biological-Integrated Rule Curves (8740700) which are assessing the effects of Dworshak operations on reservoir production and the fishery. Strategies for reservoir operations should not be considered without a full understanding of risks to endangered species present. Data collected on effects of Dworshak operations on bull trout viability should be considered in the development of rule curves and strategies to minimize entrainment losses from the reservoir.

d. Project history (for ongoing projects)

There is no past history through this funding source.

e. Proposal objectives

Objectives:

Specific tasks associated with each objective are linked to the co-manager (*NPT or IDFG*) responsible for its implementation and completion.

Biological Objective: Ensure population(s) levels of bull trout in the North Fork Clearwater River are above minimum viable population sizes which maintain adaptability and genetic diversity, and maximize probability of survival, that is breeding population(s) of a minimum of 150-300 individuals.

Assumptions: The construction and operation of Dworshak has significantly affected the distribution, abundance, and population viability of native population(s) of bull trout in Dworshak Reservoir and its tributaries. Native population(s) of bull trout in Dworshak and its tributaries can be enhanced by improvements in Dworshak operations. Habitat upstream is suitable for bull trout spawning and rearing.

Objective 1. Identify bull trout subpopulations and determine the status of the bull trout subpopulations in the North Fork Clearwater River.

Assumptions: A number of subpopulations are present in the North Fork Clearwater River. Effects of Dworshak on individual subpopulations may differ. Individual subpopulations can be identified and distinguished by spawning locality and behavior (homing/straying), or associated with life history attributes of the population.

Hypotheses:

Ho₁: Breeding subpopulations in the North Fork are not distinguished by spawning locality and behavior, or life history attributes of the subpopulation.

Ha₁: Breeding subpopulations in the North Fork Clearwater River are distinguishable by spawning locality and behavior, or life history attributes of the subpopulation.

Ho₂: All subpopulations are not viable, breeding population(s) of a minimum of 150-300 individuals.

Ha₂: All or some subpopulations are viable, breeding population(s) of a minimum of 150-300 individuals.

Task 1. Tag juvenile and adult bull trout in the reservoir and throughout the North Fork Clearwater River basin and observe movements and spawning behaviors. (*NPT: Long term movements of juvenile and adult fish in upper basin. IDFG: Seasonal movement of adults in reservoir and upper basin*).

Product: Identify population interactions, population attributes, and define sub populations in the basin.

Task 2. Observe temporal habitat use (i.e., spawning, early rearing, wintering) and critical migratory corridors. Define spawning, early rearing, and winter habitat characteristics. Define critical migratory corridors. (*NPT: Upper basin. IDFG: Reservoir*).

Product: Identify critical bull trout habitat.

Task 3. Determine distribution of bull trout (presence/absence). Estimate subpopulation structure (YOY densities). Conduct redd counts and identify breeding individuals. Assess condition and growth (*NPT*).

Product: Status of subpopulations viability (measured as 150-300 breeding individuals per population throughout basin CBFWA 1997).

Objective 2. Identify how bull trout use and are affected by Dworshak Reservoir and operations.

Assumptions: Reservoir use by bull trout varies seasonally among age classes and subpopulations. Use of the reservoir by bull trout effects (either positive or negative) bull trout subpopulation(s) viability.

Hypothesis:

Ho: Reservoir habitat/use is not critical to bull trout. Use is not associated with subpopulation viability.

Ha: Reservoir habitat is critical to bull trout. Use (seasonal, age class or population use) is associated with either negative or positive changes in subpopulation viability.

Task 1. Track bull trout use of Reservoir. (*IDFG*)

Product: Determine relative use of reservoir by subpopulations and its affect on subpopulation viability. Identify movement in and out of the reservoir -seasonal trends, use of migratory corridors.

Task 2. Monitor thermal barriers and relate to seasonal movements. (*IDFG*)

Products: Identify seasonal (operational effects) on movement/use, blockage of migratory corridors.

Objective 3. Develop and implement strategies to protect and perpetuate bull trout populations in the North Fork Clearwater River drainage.

Assumptions: Bull trout populations are affected by the management and operation of Dworshak Res

Task 1. Coordinate with other sponsored projects in the North Fork Clearwater River drainage to determine risks to bull trout subpopulations. (*IDFG and NPT*)

Product: Assessment of risks to bull trout subpopulations in the drainage.
Identification of management and operational strategies to minimize risks.

Task 2. Implement of strategies identified in Task 1. (*IDFG and NPT*).

Product: Protection and perpetuation of the bull trout subpopulations in the North Fork Clearwater River drainage.

Task 3. Monitor and evaluate strategies implemented. (*IDFG and NPT*)

Product: Evaluation of need for continuing protection and perpetuation of the bull trout subpopulations in the North Fork Clearwater River drainage.

f. Methods

METHODS—For IDFG Objectives

We will capture bull trout in Dworshak Reservoir by netting and angling techniques. Both of these methods have proven effective on reservoirs in southern Idaho. We will capture bull trout in streams (Kelly Creek, Little North Fork Clearwater River, Weitas Creek and North Fork Clearwater River) above Dworshak Reservoir by angling and electroshocking techniques. All fish will be initially held in recirculating tanks and anesthetized prior to tagging and measurements taken. We will take measurement of total length, fork lengths and total weight for all fish captured. We will concentrate sampling efforts in the upper section of Dworshak Reservoir near the mouths of the Little North Fork Clearwater River and mainstem North Fork Clearwater River. Bull trout over eight inches (250 mm) will be considered for tagging with radio/sonic transmitters. The transmitters will be inserted in the abdominal cavity. We anticipate inserting transmitters in a maximum of 50 bull trout annually for a four-year period (30 in Dworshak Reservoir and ten each in Kelly Creek and North Fork Clearwater River above Kelly Creek in 2000). We will individually mark all other bull trout with PIT tags. After initial marking all bull trout captured throughout the drainage will be observed for tags. Similar tagging investigation conducted by IDFG indicates that direct mortality due to handling will be less than 10%.

We will monitor radio transmitters at a minimum of twice every two weeks. This will be accomplished by either boat on Dworshak Reservoir, vehicle on the roaded sections of the N.F. Clearwater River and fixed-wing aircraft. We will monitor all marked bull trout by netting and angling in the reservoir, and by electroshocking the river below Dworshak Dam and selected streams above the reservoir.

We will define habitat at each capture or observation site by measuring, water depth, temperature, water velocity, and light penetration. In addition we will record associated instream or riparian cover, substrate, elevation, time of day, and general habitat type (pool, riffle, run, reservoir).

Near the end of the project, we will coordinate with the U.S. Forest Service and U.S. Army Corps of Engineers to develop relative risks to achieving our biological objectives. Associated with the risk, we will also develop strategies to minimize the risks. As strategies are implemented, will monitor the effectiveness of the strategies and the response of bull trout populations.

g. Facilities and equipment

The project's field crew will be stationed at IDFG's Clearwater Region Office in Lewiston, ID. At the Lewiston facility, the necessary clerical staff, office space, computers, etc., are available. IDFG will provide a boat suitable for use on Dworshak Reservoir, but will need to purchase an outboard motor for this project. IDFG also has electroshocking equipment suitable for the sampling work required in both the reservoir and designated streams.

h. Budget

Personnel required to conduct the IDFG portion of the investigation will include a full time fishery biologist (principal investigator) and a seasonal (8 mos) fishery technician. IDFG personnel costs total \$64,877 which includes \$17,348 of fringe benefits (@36.5%). Supplies and materials (\$18,300) include fuel for watercraft and miscellaneous items such as nets, chemicals, waders, uniforms and radio tags (50 for FY2000). The operations and maintenance budget of \$21,700 includes rental for a suitable vehicle (either commercial or GSA), field per diem, travel to meetings, and a projected 50 flights for monitoring radio-tagged bull trout. In addition an anticipated 200 PIT tags will be needed. Capital acquisitions (\$23,500) include the purchase of a 70hp outboard motor for the IDFG provided boat, equipment necessary for a fixed radio tracking receiver system to be installed at the head of Dworshak Reservoir, a portable radio/sonic tracking receiver for use in vehicles and aircraft, and a PIT tag scanner.

Section 9. Key personnel

The primary personnel involved in the IDFG portion of this project will be the project manager and a fishery biologist as the principal investigator. The project manager, Tim Cochnauer, is the Idaho Department of Fish and Game Clearwater Region fishery manager. This position is funded by sources outside of the BPA process and will serve as the administrator and supervisor of this project. The principal investigator will be a new hire as a fishery biologist. For this position, candidates must possess a good knowledge of fishery management to include habitat requirements, fish population dynamics, limnology, and stream ecology. The candidates must also show experience in fish sampling, conducting fishery research projects to include data collection, analyses and interpretation and writing a final report of results; using computers in research; developing and presenting material in a public forum; and, writing articles for publications in scientific journals. Generally candidates will have completed graduate course work and gained some experience working as a fishery professional.

Project Manager: Tim Cochnauer, PhD

Position: Regional Fish Manager, Idaho Department of Fish and Game, Clearwater Region, Lewiston, ID 83501

Address: Idaho Department of Fish and Game
Clearwater Region
1540 Warner
Lewiston, ID 83501

Phone: 208-799-5010
FAX: 208-799-5012
e-mail: tcochnau@idfg.state.id.us

Education: Doctorate in Fishery Resources, 1983, University of Idaho, Moscow, ID
MS in Zoology, 1973, University of Oklahoma, Norman, OK
BS in Zoology, 1967, University of Oklahoma, Norman, OK

Current responsibilities:

As regional fish manager, the project manager has responsibility for both anadromous and resident fish populations and fisheries within the Clearwater Region of north central Idaho. The area encompasses the entire Clearwater River drainage, the Snake River drainage upstream to Hells Canyon Dam, the Palouse River drainage, and the Salmon River drainage (north side) from its mouth upstream to Horse Creek (rkm 300). The IDFG Clearwater Region has a staff of four fishery scientists conducting a variety of activities including data collection, creel census, fish management decisions, establishing and implementing fishing seasons, etc., throughout the region. The staff has responsibility for the FWP funded Idaho Supplementation Study and Natural Production Monitoring and Evaluation projects within the region.

The project manager has over twenty-five years experience with Idaho Department of Fish and Game working in fish research, fish management and the hatchery system. Experience includes radio-tagging and monitoring a variety of fish species found in Idaho; marking and monitoring chinook salmon and steelhead trout juveniles and adults during the rearing, spawning and migratory phases of their lives; and, the use of a variety of techniques for capturing different life history phases of different species of fish. These techniques have including, electroshocking, netting, angling, rotary screen traps, weirs, and seining.

Publications:

Cochnauer, T., E. Schriever, and J. Brostrom. 1993. River and Stream Investigations. F-71-R-17. Federal Aid in Sport Fish Restoration. Idaho Department of Fish and Game.

Cochnauer, T., E. Schriever, and J. Brostrom. 1994. River and Stream Investigations. F-71-R-18. Federal Aid in Sport Fish Restoration. Idaho Department of Fish and Game.

Cochnauer, T., E. Schriever, and J. Brostrom. 1995. River and Stream Investigations. F-71-R-19. Federal Aid in Sport Fish Restoration. Idaho Department of Fish and Game.

Cochnauer, T., E. Schriever, and J. Brostrom. 1996. River and Stream Investigations. F-71-R-20. Federal Aid in Sport Fish Restoration. Idaho Department of Fish and Game.

Cochnauer, T., E. Schriever, and J. Brostrom. 1997. River and Stream Investigations. F-71-R-21. Federal Aid in Sport Fish Restoration. Idaho Department of Fish and Game.

Cochnauer, T., E. Schriever, and J. Brostrom. 1998. River and Stream Investigations. F-71-R-22. Federal Aid in Sport Fish Restoration. Idaho Department of Fish and Game.

Principal Investigator: Fishery Biologist (To be assigned)

Education: To meet the requirements for state employment in this position, individual will generally have completed graduate course work in fishery resources and will have several years of experience in field techniques and report writing.

Section 10. Information/technology transfer

The information collected will be presented in quarterly and annual reports to the funding agency. Overall significant findings will be submitted for publication in appropriate refereed professional journals. The principal investigator will present findings annually to fishery agencies, professional groups or as requested.

Congratulations!